



SHERWIN-WILLIAMS.

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March 21, 2007

Mr. Raymond Klimcsak
United States Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007-1866

**RE: Revised Soil and Sediment Sampling and Analysis Protocol Incorporating X-Ray Fluorescence (XRF)
Sherwin-Williams Gibbsboro Sites**

Dear Mr. Klimcsak:

On November 30, 2006, Sherwin-Williams provided to the United States Environmental Protection Agency (USEPA) a proposed sampling and analysis protocol that would incorporate the use of X-Ray Fluorescence (XRF) as a field analytical tool. The USEPA provided comments on that proposal in a January 25, 2007 letter. This revised document has incorporated the USEPA comments.

Sherwin-Williams began the Strategic Sampling program at the Gibbsboro sites in June 2005. Since that time, more than a thousand soil and sediment samples have been collected and analyzed, and, with the concurrence of the United States Environmental Protection Agency (USEPA), the use X-Ray Fluorescence (XRF) as a field screening tool has been incorporated into the field sampling program at Hilliard Creek. The knowledge of site conditions gained from the Strategic Sampling was not available at the time the USEPA and Sherwin-Williams completed the approved November 2003 Work Plan, and use of XRF was not included as a soil and sediment sampling tool. Sherwin-Williams has developed for the USEPA's consideration the following proposal to modify the soil and sediment sampling protocol in the November 2003 Work Plan. This protocol has been developed in a manner that will allow it to be applied at most soil and sediment sampling locations.

Presented below are discussions of how the protocol would be applied at an individual boring and at subsequent "step-out" borings. Attached as Figure 1 is a hypothetical example showing how, based on XRF results, the depths of borings would be determined, and samples would be selected for laboratory analysis.

Application of Sampling Protocol

The sampling protocol is intended to be used for future soil and sediment sampling at all of the Gibbsboro sites with the following exceptions:

- Top of stream bank and 20-foot step-out transect sampling locations. As per the revised sample collection protocol for Hilliard Creek, approved by the USEPA on May 3, 2006, samples will be collected from transect locations at the top of the stream bank and 20 feet beyond the stream bank. In the approval letter, the USEPA provided a specific sampling protocol. The protocol specified by the USEPA will be followed for these sample locations.
- Locations where the USEPA has specified alternative sampling protocols. Where the USEPA specifies the depth of a boring, the analytical parameters or other sampling procedures, the protocol specified by the USEPA will be followed.

Sampling Protocol

Soil and sediment samples will be obtained from the surface (the 0" – 6" interval) and from sequential two-foot intervals (1.5' – 2.0', 3.5' – 4.0', 5.5' – 6.0', etc.). The XRF unit will be used to screen each soil or sediment sample until, based on the XRF results, the screening criteria are achieved. An additional sample will then be collected from the next deeper two-foot interval and analyzed with the XRF unit to provide field verification that the vertical extent of the contamination has been reached. **NOTE:** If the 0" – 6" sample does not contain lead or arsenic at a concentration greater than screening criteria, a sample would still be obtained from the 1.5' – 2.0' interval. Therefore, the field team would always screen the upper two intervals with the XRF unit.

If the deeper sample is also found through XRF analysis to contain no metals at levels above screening criteria, no additional vertical samples would be obtained. If, however, the XRF results find lead or arsenic above screening criteria in the deeper sample, additional samples would be obtained from the next two-foot interval until the XRF screening finds the criteria were achieved. A sample would then be collected from the next deeper two-foot interval. This protocol will provide for a high degree of certainty that vertical delineation is achieved because two sequential two-foot sample intervals containing neither lead nor arsenic at a level above the screening criteria will be collected before vertical sample collection is terminated.

Sample Analysis

Samples would be collected for analysis from the surface and the two-foot interval at which vertical delineation is achieved, based on the XRF results. If neither the surface soil sample nor the sample collected from the 1.5' – 2.0' interval was found to contain lead or arsenic at a level greater than the screening criteria, only the surface sample would be sent for laboratory analysis.

A sample will also be obtained for laboratory analysis from the intermediate depth interval at which the XRF screening finds the highest lead and/or arsenic concentrations. If the highest levels are found at the 1.5' – 2.0' interval (which will be collected in any location where lead or arsenic is found above screening criteria), the interval with the second highest levels of lead and/or arsenic would be collected for laboratory analysis.

In summary, there are three possible sampling and analysis scenarios:

Scenario 1: XRF screening finds neither lead nor arsenic above criteria in either the 0" – 6" or 1.5' – 2.0' intervals.

- Collected and analyzed with the XRF unit: samples from the 0" – 6" and 1.5' – 2.0' intervals
- Sent for laboratory analysis: the sample from the 0" – 6" interval.

Scenario 2: XRF screening finds that only the 0" – 6" interval contains lead or arsenic at levels above the screening criteria.

- Collected and analyzed with the XRF unit: Samples from three intervals – 0" – 6", 1.5' – 2.0' and 3.5' – 4.0'
- Sent for laboratory analysis: Samples from the 0" – 6" and 1.5' – 2.5' intervals.

Scenario 3: XRF screening finds multiple intervals with lead and/or arsenic at concentrations greater than the screening criteria.

- Collected and analyzed with the XRF unit: Samples from the 0' – 6', 1.5' – 2.0', all two-foot intervals containing lead or arsenic above screening criteria, the two-foot interval at which vertical delineation is achieved, and a sample from the next deeper two-foot interval.
- Sent for analysis: Samples from the 0" – 6", 1.5' – 2.0' intervals, the interval at which vertical delineation is achieved, and the interval containing the highest concentrations of lead and/or arsenic.

Hypothetical Application

Figure 1 presents a hypothetical example of how the proposed sampling protocol would be applied at a hypothetical boring. Using the protocol at the "initial perimeter boring" (such as the fence line boring in the Wawa parking lot), the surface and two-foot intervals would be sampled until the 9.5' – 10.0' interval, where both lead and arsenic were found to be below their respective screening criteria. At that point, the boring would be extended and a sample obtained from the 11.5' – 12.0' interval. In this example, lead and arsenic levels in the 11.5' – 12.0' sample are below the screening criteria; therefore, the depth of the boring would be terminated.

As per the protocol, four samples would be collected from the hypothetical boring for laboratory analysis:

- The samples obtained from the surface and 1.5' – 2.0' intervals;
- The sample from the 5.5' – 6.0' interval, where the highest arsenic and lead levels are found; and
- The sample from the 9.5' – 10.0' interval, where vertical delineation to the screening criteria was achieved.

Use of Protocol for Horizontal Delineation

When additional samples are collected for horizontal delineation ("step-out borings"), as will be the case when borings are installed in the Wawa parking lot adjacent to the Dump Site or samples are collected from the exterior locations on the stream transects, the results of the XRF analysis of the initial boring will be known. This means that the field team will understand the vertical profile of COPCs in soil, including the depth at which vertical delineation is achieved in the initial boring.

Subsequent step out borings would use the same XRF screening approach, but, regardless of the XRF results, would always be completed to at least the depth at which the immediately adjacent boring was vertically delineated. Again referring to Figure 1, the hypothetical initial/perimeter boring is shown to be vertically delineated at the 9.5' – 10.0' interval. Therefore, the first step out boring would be completed to a minimum of 10 feet, even though, in the hypothetical example, the XRF results show vertical delineation at 5.5' – 6.0'. Similarly, as illustrated in the hypothetical example on Figure 1, the second step out boring would be completed to a depth of 5.5' – 6.0', because this is the depth at which vertical delineation was achieved in the adjacent step out boring, even though vertical delineation is achieved in the second step out boring at the 1.5' – 2.0' interval.

Summary

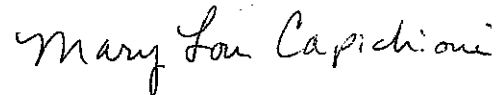
The proposed sampling protocol is designed to make effective use of the XRF tool in the field and address the issue of vertical heterogeneity of lead and arsenic in soil and sediment. The protocol would use the XRF screening to determine the depth of the boring and the interval(s) at which the highest concentrations of lead and/or arsenic are likely to be found. Depending upon the vertical profile of lead and arsenic concentrations, up to four samples would be obtained from the boring: Surface, 1.5' – 2.0', the interval with the highest lead and/or arsenic levels, and the vertical delineation depth. Fewer samples would be obtained if the XRF analyses showed vertical delineation at shallow depths.

Samples collected for the purpose of establishing the horizontal extent to which constituents may be present around the perimeter of one of the historic disposal sites or beyond the banks of one of the water bodies would be subject to the same protocol except

that the minimum depth of each subsequent step out sample will be the depth at which the adjacent interior sample was found to be vertically delineated.

Should you have any questions or comments, please do not hesitate to contact me at 216-566-1794.

Sincerely,



Mary Lou Capichioni
Director, Remediation Services

Encl.:

cc: J. Gerulis, Sherwin-Williams, w/o encl.
A. Danzig, Sherwin-Williams, w/o encl.
J. Josephson, USEPA-Reg.2, w/ encl.
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L. Arabia, TtFWI, w/ encl.
S. Peticolas, Esq., Gibbons, Del Deo, Dolan, Griffinger & Vecchione, w/ encl.

Initial/Perimeter Boring

Depth	XRF
0-6"	As 250 Pb 2,000
1.5-2.0'	As 200 Pb 1,500
3.5-4.0'	As 300 Pb 1,000
5.5-6.0'	As 500 Pb 4,000
7.5-8.0'	As 50 Pb 500
9.5-10.0'	As 2 Pb 50
11.5-12.0'	As 1 Pb 20

1st Incremental Step-Out Boring

Depth	XRF
0-6"	As 90 Pb 750
1.5-2.0'	As 150 Pb 1,000
3.5-4.0'	As 200 Pb 2,000
5.5-6.0'	As 6 Pb 300
7.5-8.0'	As 2 Pb 20
9.5-10.0'	As 2 Pb 20

Next Incremental Step-Out Boring

Depth	XRF
0-6"	As 30 Pb 450
1.5-2.0'	As 5 Pb 300
3.5-4.0'	As 2 Pb 30
5.5-6.0'	As 1 Pb 20

LEGEND: <input checked="" type="checkbox"/> - SAMPLE COLLECTED FOR LABORATORY ANALYSIS	
As - 8 ppm Pb - 50 ppm	} SEDIMENT DELINEATION CRITERIA
As - 8 ppm Pb - 400 ppm	} SOIL DELINEATION CRITERIA
PROJECT: Gibbsboro RI/FS	
CLIENT NAME: Sherwin-Williams Company	

TITLE:	
EXAMPLE OF HORIZONTAL & VERTICAL SAMPLING PROTOCOLS	
DATE: Sep 27 2006	FIGURE #: 1